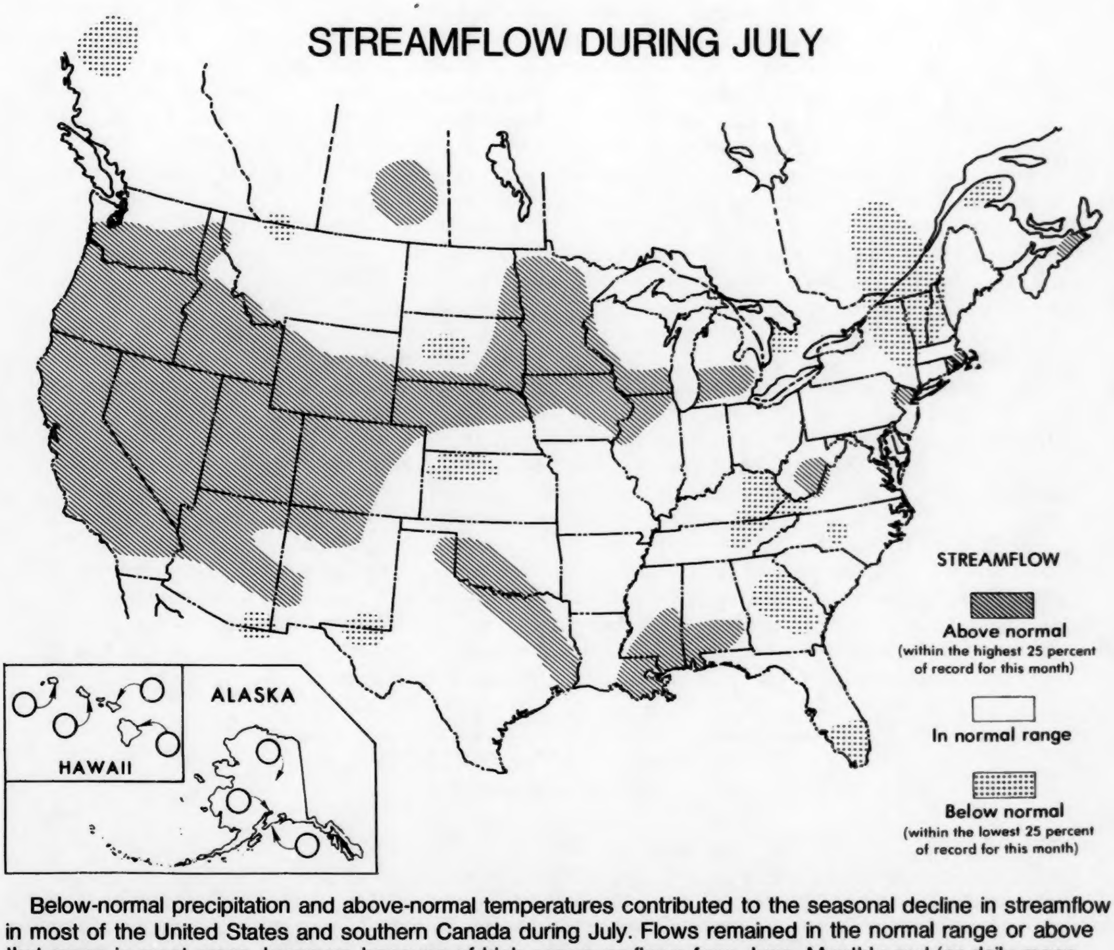
National Water Conditions

UNITED STATES
Department of the Interior
Geological Survey

CANADA
Department of the Environment
Water Resources Branch

JULY 1983

STREAMFLOW DURING JULY



Below-normal precipitation and above-normal temperatures contributed to the seasonal decline in streamflow in most of the United States and southern Canada during July. Flows remained in the normal range or above that range in most areas, however, because of high carryover flows from June. Monthly and/or daily mean flows were highest of record for the month in parts of eight States and one Province.

Contents of principal reservoirs generally decreased during the month but were near or well above average at most locations at month's end. Lakes and reservoirs in the Colorado River basin generally remained at record-high levels.

STREAMFLOW CONDITIONS DURING JULY 1983

Streamflow decreased seasonally in most of the United States and southern Canada during July except for Minnesota and Saskatchewan, and parts of Alaska, Arizona, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, North Dakota, Nova Scotia, Ontario, Oregon, and Washington, where monthly mean flows increased. Flows remained in the above-normal range in parts of Rhode Island, New Jersey, West Virginia, Michigan, Iowa, Nebraska, South Dakota, North Dakota, the Gulf Coastal States except for Florida, and all Western States except for Montana, Oregon, and Washington. Monthly and/or daily mean flows were highest of record for the month in parts of California, Colorado, Iowa, Minnesota, Oregon, Saskatchewan, Utah, Washington, and Wyoming. (See table on page 3.) For example, in southern Wyoming, the monthly mean discharge of 5,400 cubic feet per second (cfs) and the daily mean flow of 11,350 cfs on July 1 at North Platte River above Seminoe Reservoir, near Sinclair (drainage area, 8,134 square miles) were highest for July in 44 years of record. Similarly, in eastern Utah, the monthly mean flow of 27,500 cfs on the Colorado River near Cisco (drainage area, 24,100 square miles) was down 40 percent from the near record high flows in June but was, nevertheless, the second highest flow for July in 72 years of record. (See graph on page 3.)

By contrast, below-normal streamflow persisted in parts of Arizona, Florida, Georgia, Kansas, and Montana. Elsewhere, monthly mean flows decreased into the below-normal range in parts of Kentucky, New Hampshire, New Mexico, New York, North Carolina, South Dakota, Tennessee, Vermont, Virginia, British Columbia, Ontario, and Quebec, and were lowest of record for the month in parts of Arizona and New Mexico. For example, in southern Arizona, the monthly mean flow of 2.31 cfs at San Pedro River at Charleston (drainage area 1,219 square miles) was lowest for July in 72 years of record and flow at that site remained in the below-normal range for the second consecutive month. In southeastern New Mexico, flow of the Delaware River near Red Bluff (drainage area, 689 square miles) ceased during the month and tied the record low of zero flow recorded at that site in July 1947. Parts of Quebec, Ontario, New York, Kentucky, and Vermont also experienced sharp decreases in streamflow during the month. For example, in central Vermont, where monthly mean discharge of Dog River at Northfield Falls was above the normal range for the 3-month period prior to July, mean flow decreased sharply to only 66 percent of median and was in the below-normal range for the first time since November 1982.

In North Carolina, the capacity of water treatment plants in Mecklenburg County and Wake County were exceeded due to deficient rainfall and above-normal temperatures during the week of July 17. Residents were requested to voluntarily conserve water.

In Virginia, a weighted average of streamflows in the State was 75 percent of median for July, down from 113 percent of median in June 1983, and in sharp contrast to July 1982 when the weighted average of flows was 165 percent of median.

In northern Nebraska, moderate flooding from up to 7 inches of rain on July 16–17 in the Niobrara River basin caused several county road washouts and evacuations of campgrounds. The peak flow at Niobrara River near Norden of about 4,800 cfs was the third highest in 31 years of record. Similarly, runoff from rains in excess of 7 inches in northwestern Indiana on July 2 caused flood flows on Hobart and Salt Creeks with recurrence intervals between 10 and 25 years. Lowland flooding was also reported along portions of the Kankakee and Tippecanoe Rivers during this period. Persistent high water on some northern Indiana lakes with no natural outlet were being lowered through pumpage. In Kansas, several small streams in Wichita were out of their banks and local areas were flooded as a

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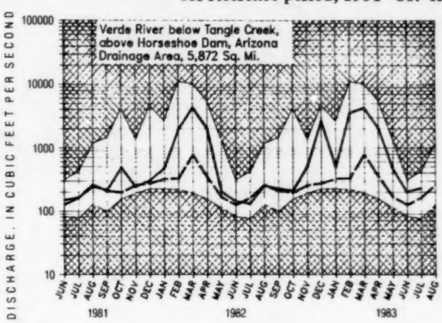
result of runoff from up to 6 inches of rain on July3–4. Runoff from this storm produced a peak discharge of 19,000 cfs on the Arkansas River at Arkansas City on July 6. Elsewhere in Kansas, flows were in the normal or below-normal range as a result of well below-normal precipitation.

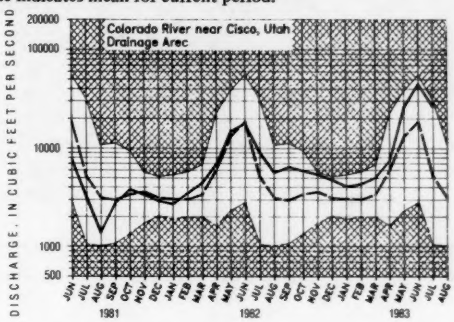
The normal to above-normal trend in streamflow was reflected in the combined flow of three large rivers—Mississippi, St. Lawrence, and Columbia—which averaged 1,139,500 cfs during July, down 43 percent from last month but still 20 percent above average for July.

Contents of principal reservoirs generally decreased during July but were near or well above average at month's end except for some reservoirs in Texas, Oklahoma, Wyoming, Vermont, and New Hampshire, which were slightly below long-term averages.

SURFACE WATER – MONTHLY MEAN DISCHARGE IN KEY STREAMS

Unshaded area indicates range between highest and lowest record for the month. Dashed line indicates median of monthly values for reference period, 1951–80. Heavy line indicates mean for current period.





NEW MAXIMUMS DURING JULY 1983 AT STREAMFLOW INDEX STATIONS

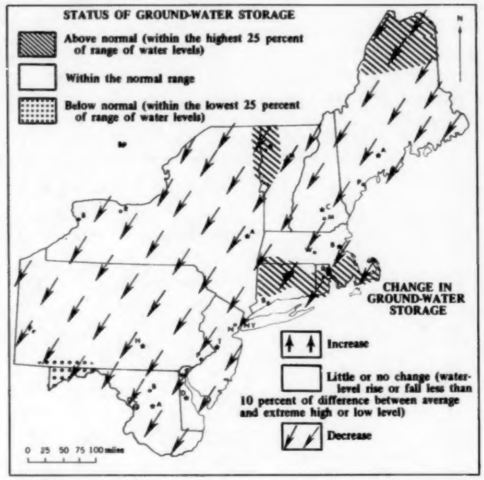
Station number	Stream and place of determination	Drainage area (square miles)	Years of record	Previous July maximums (period of record)		July 1983			
				Monthly mean in cfs (year)	Daily mean in cfs (year)	Monthly mean in cfs	Percent of median	Daily mean in cfs	Day
05330000	Minnesota River near Jordan, Minnesota.	16,200	49	12,270 (1957)	26,700 (1957)	12,716	303	25,100	8
05480500	Des Moines River at Fort Dodge, Iowa.	4,190	51	8,883 (1969)	13,100 (1947)	7,890	777	17,500	3
05940100	Qu'Appelle River at Lumsden, Saskatchewan, Canada.	6,780	72	1,040 (1953)	1,260 (1953)	491	532	1,391	11
06485500	Big Sioux River at Akron, Iowa . . .	9,030	55	3,239 (1969)	11,400 (1969)	4,670	891	11,700	2
06630000	North Platte River above Seminoe Reservoir, near Sinclair, Wyoming.	8,134	44	5,023 (1957)	9,240 (1957)	5,400	436	11,350	1
06710500	Bear Creek at Morrison, Colorado. .	164	68	249 (1949)	600 (1933)	163	342	2,840	22
10234500	Beaver River near Beaver, Utah . . .	91.0	69	157 (1980)	449 (1980)	235	420	......	...
10296000	West Walker River below Little Walker River, near Coleville, California.	180	45	1,364 (1967)	2,660 (1967)	1,371	365	2,460	6
11264500	Merced River at Happy Isles Bridge, near Yosemite, California.	181	68	1,745 (1967)	3,900 (1967)	1,992	598	3,900	6
11425500	Sacramento River at Verona, California.	21,257	54	19,110 (1974)	23,700 (1967)	24,596	253	29,600	1
11427000	North Fork American River at North Fork Dam, California.	342	42	678 (1952)	2,210 (1974)	928	725	2,160	2
12027500	Chehalis River near Grand Mound, Washington.	895	55	639 (1974)	1,690 (1946)	920	258	2,220	14
14191000	Willamette River at Salem, Oregon.	7,280	67	11,830 (1933)	....	13,050	237	21,400	4
14301500	Wilson River near Tillamook, Oregon.	161	53	304 (1937)	716 (1974)	450	326	678	14

GROUND-WATER CONDITIONS DURING JULY 1983

Ground-water levels continued to decline seasonally in the Northeast. (See map.) Near the end of the month, levels were near average for this time of year in most of the region. The major exception was an area that included most of Connecticut, Rhode Island, and southeastern Massachusetts, where ground-water levels remained above average.

In the southeastern States, ground-water levels showed mixed trends in West Virginia, Kentucky, Arkansas, Louisiana, and Florida. Levels declined seasonally in Virginia, North Carolina, Mississippi, Alabama, and Georgia. Water levels were above long-term averages in Kentucky, Virginia, Alabama, and in parts of West Virginia, North Carolina, and Louisiana. Levels were below average in Arkansas and in much of Florida. A new high ground-water level was recorded in Kentucky, despite a net decline in level during the month.

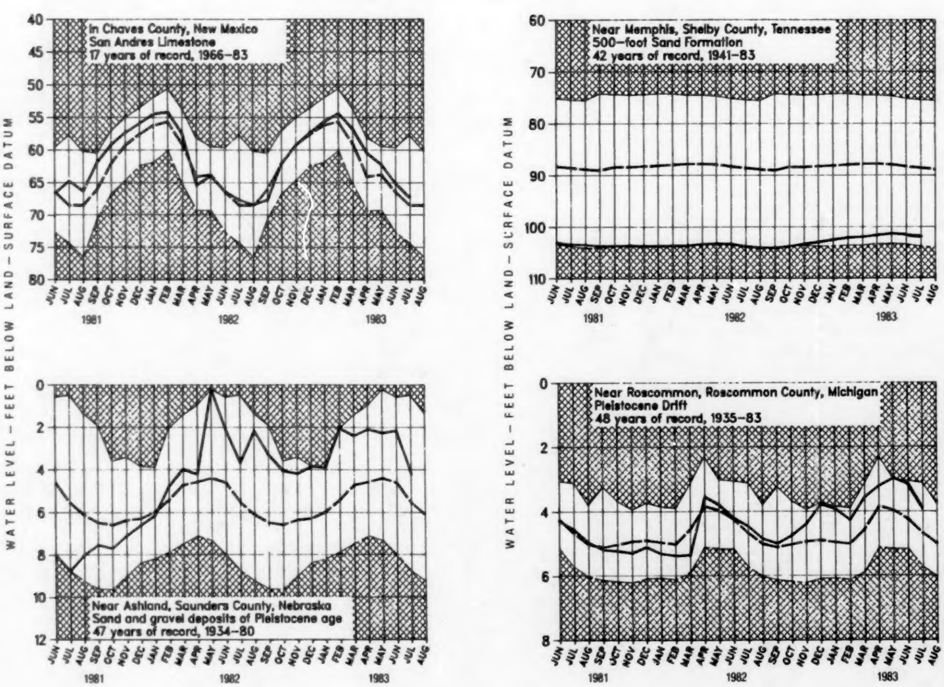
In the central and western Great Lakes States, ground-water levels showed mixed trends in Minnesota and Iowa,



Map shows ground-water storage near end of July and change in ground-water storage from end of June to end of July.

MONTH-END GROUND-WATER LEVELS IN KEY WELLS

Unshaded area indicates range between highest and lowest record for the month. Dashed line indicates average of monthly levels in previous years. Heavy line indicates level for current period.



WATER LEVELS IN KEY OBSERVATION WELLS IN SOME REPRESENTATIVE AQUIFERS IN THE CONTERMINOUS UNITED STATES—JULY 1983

Aquifer and location	Current water level in feet below land-surface datum	Departure from average in feet	Net change in water level in feet since:		Year records began	Remarks
			Last month	Last year		
Glacial drift at Hanska, south-central Minnesota	-5.33	+0.97	-0.30	+0.67	1943	
Glacial drift at Roscommon in north-central part of Lower Peninsula, Michigan	-3.94	+0.72	-0.78	+0.52	1935	
Glacial drift at Marion, Iowa	-4.96	+0.25	-0.58	-3.22	1941	
Glacial drift at Princeton in northwestern Illinois	-11.00	+0.73	-2.36	-4.02	1943	
Petersburg Granite, southeastern Piedmont near Fall Zone, Colonial Heights, Virginia	-15.84	+0.28	-0.99	-0.40	1939	
Glacial outwash sand and gravel, Louisville, Kentucky	-17.36	+8.16	+0.04	+0.86	1946	
500-foot sand aquifer near Memphis, Tennessee (U.S. well no. 2)	-102.24	-13.76	-0.74	+1.49	1941	
Granite in eastern Piedmont Province, Chapel Hill, North Carolina	-38.54	+3.24	-0.80	+1.56	1931	
Sparta Sand in Pine Bluff industrial area, Arkansas	-226.40	-22.10	+5.00	+3.55	1958	
Copper Ridge and Chepultepec Dolomites, Centreville, Alabama	-27.8	+1.5	-1.2	+0.4	1952	
Limestone aquifer on Cockspur Island, Savannah area, Georgia	-24.35	-5.67	-0.90	+0.25	1956	
Sand and gravel in Puget Trough, Tacoma, Washington	-106.38	+4.74	-5.99	-1.80	1952	
Pleistocene glacial outwash gravel, North Pole, northern Idaho (U.S. well no. 3)	-454.8	+4.7	+0.7	+3.1	1929	
Snake River Group: southwestern Snake River Plain aquifer, at Eden, Idaho	-124.6	-7.6	+2.0	+1.2	1957	
Terrace gravel at Missoula, Montana	-13.40	-1.23	-0.4	-0.1	1960	
Alluvial sand and gravel, Platte River Valley, Nebraska (U.S. well no. 6)	-4.15	+1.35	-1.99	-0.48	1935	
Alluvial valley fill in Steptoe Valley, Nevada	-10.42	-3.03	-0.71	+0.87	1950	July high.
Ogallala Formation, Kansas Agricultural Experiment Station at Colby in the High Plains of northwestern Kansas	-125.86	-8.75	-1.36	-1.36	1947	
Alluvium and Paso Robles, clay, sand, and gravel, Santa Maria Valley, California	-119.68	+25.97	-0.44	+32.99	1957	
Valley fill, Elfrida area, Douglas, Arizona (U.S. well no. 15)	-112.2	-32.82	+9.4	+3.4	1951	
Berrendo-Smith well in San Andres Limestone, Roswell artesian basin of Pecos Valley, New Mexico (U.S. well no. 1-A)	-66.89	+1.54	-1.74	+0.79	1966	
Hueco bolson, El Paso area, Texas	-261.12	-13.27	-0.17	+2.11	1965	
Evangeline aquifer, Houston area, Texas	-322.01	-23.41	-2.85	+3.39	1965	

and generally declined in Wisconsin, Michigan, and Ohio. Levels were above average in Minnesota and in most of Iowa, near to above average in Michigan, and near average in Wisconsin. Levels were near average or slightly below average in Indiana and Ohio.

In the western States, ground-water levels showed mixed trends in Idaho, Montana, North Dakota, Nebraska, southern California, Utah, Arizona, and Texas. Levels declined in Washington, Nevada, Kansas, and New Mexico. Levels were above average in Washington, Nebraska, and southern California, above and below average in Idaho, North Dakota, Nevada, Utah, Kansas, New Mexico, and Texas, and below average in Montana and Arizona. New high ground-water levels for July occurred in Nebraska, southern California, and Nevada, and new low levels for July occurred in Nevada, Arizona, and New Mexico.

USABLE CONTENTS OF SELECTED RESERVOIRS NEAR END OF JULY 1983

[Contents are expressed in percent of reservoir capacity. The usable storage capacity of each reservoir is shown in the column headed "Normal maximum."]

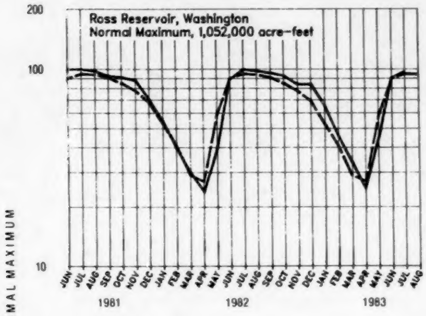
Reservoir Principal uses: F–Flood control I–Irrigation M–Municipal P–Power R–Recreation W–Industrial	Percent of normal maximum				Normal maximum (acre-feet)[a]
	End of July 1983	End of July 1982	Average for end of July	End of June 1983	
NOVA SCOTIA					
Rossignol, Mulgrave, Falls Lake, St. Margaret's Bay, Black, and Ponhook Reservoirs (P)	62	64	60	76	[b]226,300
QUEBEC					
Allard (P)	77	81	76	87	280,600
Gouin (P)	95	51	69	98	6,954,000
MAINE					
Seven reservoir systems (MP)	86	79	79	95	4,098,000
NEW HAMPSHIRE					
First Connecticut Lake (P)	83	88	89	92	76,450
Lake Francis (FPR)	72	76	86	84	99,310
Lake Winnipesaukee (PR)	86	94	88	99	165,700
VERMONT					
Harriman (P)	85	81	78	89	116,200
Somerset (P)	72	82	82	92	57,390
MASSACHUSETTS					
Cobble Mountain and Borden Brook (MP)	81	88	83	86	77,920
NEW YORK					
Great Sacandaga Lake (FPR)	83	84	82	95	786,700
Indian Lake (FMP)	94	90	90	95	103,300
New York City reservoir system (MW)	89	94	...	96	1,680,000
NEW JERSEY					
Wanaque (M)	87	96	82	97	85,100
PENNSYLVANIA					
Allegheny (FPR)	48	50	45	47	1,180,000
Pymatuning (FMR)	93	98	93	116	188,000
Raystown Lake (FR)	62	68	61	63	761,900
Lake Wallenpaupack (PR)	73	73	73	85	157,800
MARYLAND					
Baltimore municipal system (M)	96	91	91	99	255,800
NORTH CAROLINA					
Bridgewater (Lake James) (P)	94	95	90	96	288,800
Narrows (Badin Lake) (P)	101	92	97	92	128,900
High Rock Lake (P)	81	86	77	84	234,800
SOUTH CAROLINA					
Lake Murray (P)	88	92	77	93	1,614,000
Lakes Marion and Moultrie (P)	83	85	71	83	1,862,000
SOUTH CAROLINA––GEORGIA					
Clark Hill (FP)	76	81	70	80	1,730,000
GEORGIA					
Burton (PR)	94	96	91	99	104,000
Sinclair (MPR)	86	88	90	89	214,000
Lake Sidney Lanier (FMPR)	62	61	61	67	1,686,000
ALABAMA					
Lake Martin (P)	96	98	90	99	1,375,000
TENNESSEE VALLEY					
Clinch Projects: Norris and Melton Hill Lakes (FPR)	60	54	56	71	2,229,300
Douglas Lake (FPR)	67	58	60	83	1,394,000
Hiwassee Projects: Chatuge, Nottely, Hiwassee, Apalachia, Blue Ridge, Ocoee 3, and Parksville Lakes (FPR)	82	77	76	85	1,012,000
Holston Projects: South Holston, Watauga, Boone, Fort Patrick Henry, and Cherokee Lakes (FPR)	70	63	62	82	2,880,000
Little Tennessee Projects: Nantahala, Thorpe, Fontana, and Chilhowee Lakes (FPR)	80	71	77	91	1,478,000
WISCONSIN					
Chippewa and Flambeau (PR)	82	87	83	91	365,000
Wisconsin River (21 reservoirs) (PR)	79	87	74	91	399,000
MINNESOTA					
Mississippi River headwater system (FMR)	37	38	38	37	1,640,000
NORTH DAKOTA					
Lake Sakakawea (Garrison) (FIPR)	94	91	94	89	22,700,000
SOUTH DAKOTA					
Angostura (I)	86	89	87	95	127,600
Belle Fourche (I)	61	83	55	84	185,200
Lake Francis Case (FIP)	76	76	81	84	4,834,000
Lake Oahe (FIP)	96	92	...	97	22,530,000
Lake Sharpe (FIP)	102	99	100	100	1,725,000
Lewis and Clarke Lake (FIP)	94	89	94	93	477,000

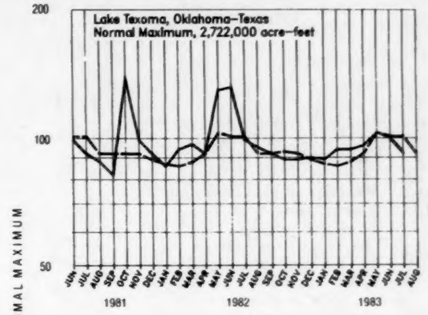
Reservoir Principal uses: F–Flood control I–Irrigation M–Municipal P–Power R–Recreation W–Industrial	Percent of normal maximum				Normal maximum (acre-feet)[a]
	End of July 1983	End of July 1982	Average for end of July	End of June 1983	
NEBRASKA					
Lake McConaughy (IP)	97	78	74	97	1,948,000
OKLAHOMA					
Eufaula (FPR)	95	98	88	102	2,378,000
Keystone (FPR)	85	113	96	103	661,000
Tenkiller Ferry (FPR)	101	104	96	105	628,200
Lake Altus (FIMR)	68	93	66	82	133,000
Lake O'The Cherokees (FPR)	91	93	91	95	1,492,000
OKLAHOMA––TEXAS					
Lake Texoma (FMPRW)	93	99	101	100	2,722,000
TEXAS					
Bridgeport (IMW)	91	100	50	87	386,400
Canyon (FMR)	93	94	75	94	385,600
International Amistad (FIMPW)	77	97	76	80	3,497,000
International Falcon (FIMPW)	39	91	70	39	2,668,000
Livingston (IMW)	100	100	85	101	1,788,000
Possum Kingdom (IMPRW)	90	94	99	96	570,200
Red Bluff (PI)	12	13	23	13	307,000
Toledo Bend (P)	92	94	89	98	4,472,000
Twin Buttes (FIM)	28	49	28	31	177,800
Lake Kemp (IMW)	84	101	89	87	268,000
Lake Meredith (FWM)	50	40	38	52	796,900
Lake Travis (FIMPRW)	88	95	78	94	1,144,000
MONTANA					
Canyon Ferry (FIMPR)	95	96	92	96	2,043,000
Fort Peck (FPR)	89	87	91	87	18,910,000
Hungry Horse (FIPR)	100	100	97	99	3,451,000
WASHINGTON					
Ross (PR)	98	100	96	91	1,052,000
Franklin D. Roosevelt Lake (IP)	103	100	100	94	5,022,000
Lake Chelan (PR)	99	99	98	100	676,100
Lake Cushman (PR)	103	103	99	102	359,500
Lake Merwin (P)	105	105	105	101	245,600
IDAHO					
Boise River (4 reservoirs) (FIP)	88	92	76	89	1,235,000
Coeur d'Alene Lake (P)	97	98	82	102	238,500
Pend Oreille Lake (FP)	98	99	95	99	1,561,000
IDAHO––WYOMING					
Upper Snake River (8 reservoirs) (MP)	91	93	72	95	4,401,000
WYOMING					
Boysen (FIP)	100	101	90	106	802,000
Buffalo Bill (IP)	102	104	101	105	421,300
Keyhole (F)	30	30	50	35	193,800
Pathfinder, Seminoe, Alcova, Kortes, Glendo, and Guernsey Reservoirs (I)	95	62	58	99	3,056,000
COLORADO					
John Martin (FIR)	49	6	17	47	364,400
Taylor Park (IR)	102	83	90	81	106,200
Colorado–Big Thompson project (I)	95	53	71	89	722,600
COLORADO RIVER STORAGE PROJECT					
Lake Powell; Flaming Gorge, Fontenelle, Navajo, and Blue Mesa Reservoirs (IFPR)	103	92	...	104	31,620,000
UTAH––IDAHO					
Bear Lake (IPR)	99	92	67	99	1,421,000
CALIFORNIA					
Folsom (FIP)	95	94	78	100	1,000,000
Hetch Hetchy (MP)	101	100	79	100	360,400
Isabella (FIR)	93	92	43	110	568,100
Pine Flat (FI)	97	92	56	90	1,001,000
Clair Engle Lake (Lewiston) (P)	99	98	84	100	2,438,000
Lake Almanor (P)	105	105	62	103	1,036,000
Lake Berryessa (FIMW)	96	95	81	98	1,600,000
Millerton Lake (FI)	98	100	66	100	503,200
Shasta Lake (FIPR)	97	94	79	103	4,377,000
CALIFORNIA––NEVADA					
Lake Tahoe (IPR)	95	97	70	68	744,600
NEVADA					
Rye Patch (I)	99	91	69	95	194,300
ARIZONA––NEVADA					
Lake Mead and Lake Mohave (FIMP)	102	85	74	99	27,970,000
ARIZONA					
San Carlos (IP)	57	13	15	62	1,073,000
Salt and Verde River system (IMPR)	89	73	42	92	2,019,100
NEW MEXICO					
Conchas (FIR)	84	60	81	88	330,100
Elephant Butte and Caballo (FIPR)	58	35	28	57	2,453,000

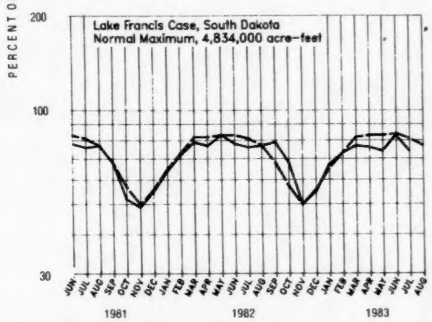
[a]1 acre-foot = 0.0436 million cubic feet = 0.326 million gallons = 0.504 cubic feet per second day.
[b]Thousands of kilowatt-hours (the potential electric power that could be generated by the volume of water in storage).

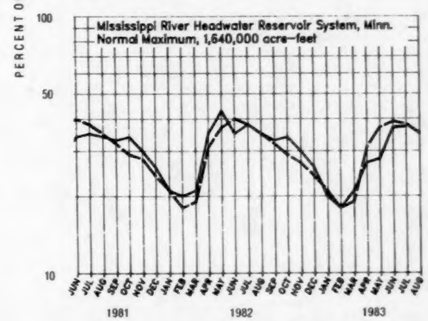
UASBLE CONTENTS OF SELECTED RESERVOIRS AND RESERVOIR SYSTEMS, JUNE 1981 TO JULY 1983

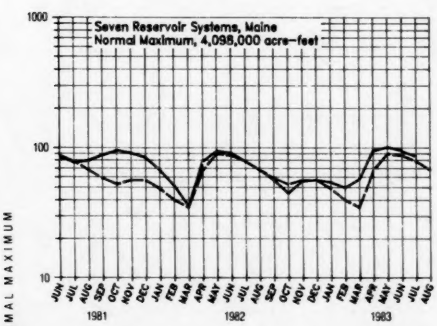
Dashed line indicates average of month-end contents. Solid line indicates current period.

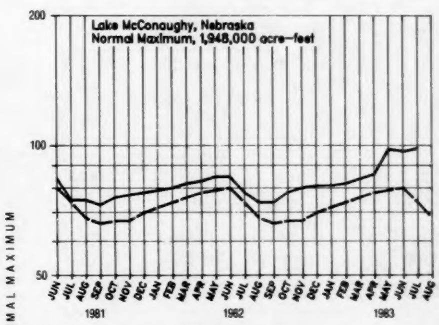


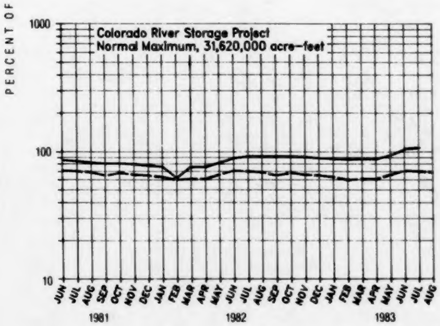


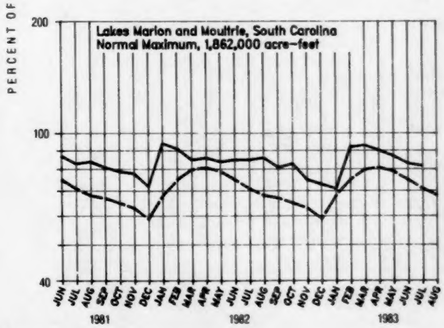












FLOW OF LARGE RIVERS DURING JULY 1983

Station number	Stream and place of determination	Drainage area (square miles)	Mean annual discharge through September 1980 (cubic feet per second)	July 1983					
				Monthly mean discharge (cubic feet per second)	Percent of median monthly discharge, 1951–80	Change in discharge from previous month (percent)	Discharge near end of month		
							Cubic feet per second	Million gallons per day	Date
01014000	St. John River below Fish River at Fort Kent, Maine	5,690	9,647	4,091	88	-72	2,600	1,680	31
01318500	Hudson River at Hadley, N.Y	1,664	2,909	586	57	-85	330	213	31
01357500	Mohawk River at Cohoes, N.Y	3,456	5,734	970	52	-72	740	478	31
01463500	Delaware River at Trenton, N.J	6,780	11,750	5,590	116	-56	4,290	2,772	31
01570500	Susquehanna River at Harrisburg, Pa	24,100	34,530	17,160	145	-37	7,400	4,780	31
01646500	Potomac River near Washington, D.C.	11,560	[1]11,490	4,120	103	-64	2,300	1,490	31
02105500	Cape Fear River at William O. Huske Lock near Tarheel, N.C.	4,810	5,005	1,360	70	-32	1,000	600	31
02131000	Pee Dee River at Peedee, S.C	8,830	9,851	4,250	75	-40	2,940	1,900	25
02226000	Altamaha River at Doctortown, Ga	13,600	13,880	4,840	73	-23	3,400	2,200	29
02320500	Suwannee River at Branford, Fla	7,880	6,987	7,160	139	-16	5,530	3,574	31
02358000	Apalachicola River at Chattahoochee, Fla	17,200	22,570	17,500	130	+4	13,900	8,980	31
02467000	Tombigbee River at Demopolis lock and dam near Coatopa, Ala	15,400	23,300	10,430	166	-58	4,200	2,710	31
02489500	Pearl River near Bogalusa, La	6,630	9,768	8,150	252	-66	4,010	2,591	31
03049500	Allegheny River at Natrona, Pa	11,410	[1]19,480	9,866	164	-31	6,500	4,200	25
03085000	Monongahela River at Braddock, Pa.	7,337	[1]12,510	3,686	91	-62	3,650	2,359	25
03193000	Kanawha River at Kanawha Falls, W. Va	8,367	12,590	7,493	146	-24	9,180	5,933	27
03234500	Scioto River at Higby, Ohio	5,131	4,547	2,083	124	-41	1,350	872	29
03294500	Ohio River at Louisville, Ky[2]	91,170	116,000	50,850	104	-39	87,050	56,261	25
03377500	Wabash River at Mount Carmel, Ill	28,635	27,220	13,100	85	-51	6,400	4,140	31
03469000	French Broad River below Douglas Dam, Tenn	4,543	6,798	4,567	111	-4	......	......	...
04084500	Fox River at Rapide Croche Dam, near Wrightstown, Wis[2]	6,150	4,163	2,543	106	-34	......	......	...
04264331	St. Lawrence River at Cornwall, Ontario–near Massena, N.Y[3]	299,000	242,700	282,000	103	-5	274,000	177,100	31
050115	St. Maurice River at Grand Mere, Quebec	16,300	25,150	10,100	51	-86	14,300	9,240	29
05082500	Red River of the North at Grand Forks, N. Dak	30,100	2,551	5,995	225	+20	4,220	2,727	25
05133500	Rainy River at Manitou Rapids, Minn.	19,400	12,830	17,000	104	+37	12,300	7,950	26
05330000	Minnesota River near Jordan, Minn.	16,200	3,402	12,716	303	+47	4,000	2,600	31
05331000	Mississippi River at St. Paul, Minn	36,800	[1]10,610	30,929	236	+44	13,100	8,470	31
05365500	Chippewa River at Chippewa Falls, Wis.	5,600	5,100	3,503	111	-15	3,000	1,900	31
05407000	Wisconsin River at Muscoda, Wis	10,300	8,617	6,021	106	-36	5,140	3,322	31
05446500	Rock River near Joslin, Ill	9,551	5,873	8,370	241	+5	4,600	2,970	31
05474500	Mississippi River at Keokuk, Iowa	119,000	62,620	110,100	176	+17	65,900	42,590	31
06214500	Yellowstone River at Billings, Mont	11,796	7,038	16,520	110	-27	10,200	6,590	28
06934500	Missouri River at Hermann, Mo	524,200	79,490	109,700	145	-28	74,700	48,280	31
07289000	Mississippi River at Vicksburg, Miss[4]	1,140,500	576,600	550,300	129	-56	432,000	279,200	29
07331000	Washita River near Dickson, Okla.	7,202	1,368	1,082	260	-50	415	268	27
08276500	Rio Grande below Taos Junction Bridge, near Taos, N. Mex	9,730	725	1,495	457	-59	700	450	28
09315000	Green River at Green River, Utah.	40,600	6,298	21,660	379	-43	11,500	7,430	31
11425500	Sacramento River at Verona, Calif	21,257	18,820	24,600	253	-38	21,300	13,770	31
13269000	Snake River at Weiser, Idaho	69,200	18,050	22,900	207	-49	10,800	6,980	28
13317000	Salmon River at White Bird, Idaho	13,550	11,250	21,000	144	-59	12,100	7,820	28
13342500	Clearwater River at Spalding, Idaho	9,570	15,480	12,240	56	-57	6,630	4,285	28
14105700	Columbia River at The Dalles, Oreg[5]	237,000	193,100	307,200	110	-34	190,400	123,060	26
14191000	Willamette River at Salem, Oreg.	7,280	23,510	13,050	237	0	9,200	5,950	26
15515500	Tanana River at Nenana, Alaska.	25,600	23,460	62,610	107	+75	58,800	38,000	29
8MF005	Fraser River at Hope, British Columbia	83,800	96,290	187,800	99	-13	174,100	112,500	28

[1] Adjusted.
[2] Records furnished by Corps of Engineers.
[3] Records furnished by Buffalo District, Corps of Engineers, through International St. Lawrence River Board of Control. Discharges shown are considered to be the same as discharge at Ogdensburg, N.Y. when adjusted for storage in Lake St. Lawrence.
[4] Records of daily discharge computed jointly by Corps of Engineers and Geological Survey.
[5] Discharge determined from information furnished by Bureau of Reclamation, Corps of Engineers, and Geological Survey.

Provisional data; subject to revision

DISSOLVED SOLIDS AND WATER TEMPERATURES FOR JULY 1983 AT DOWNSTREAM SITES ON SIX LARGE RIVERS

Station number	Station name	July data of following calendar years	Stream discharge during month	Dissolved-solids concentration during month[a]		Dissolved-solids discharge during month[a]			Water temperature during month[b]		
			Mean (cfs)	Minimum (mg/L)	Maximum (mg/L)	Mean (tons per day)	Minimum (tons per day)	Maximum (tons per day)	Mean in°C	Mini-mum, in°C	Maxi-mum, in°C
	NORTHEAST										
01463500	Delaware River at	1983	5,590	90	125	1,640	1,130	3,000	27.0	23.0	29.0
	Trenton, N.J.	1945–82	7,119	57	145	......	465	16,700	....	18.5	33.5
	(Morrisville, Pa.)	(Extreme yr)		(1947)	(1978)		(1965)	(1969)			
			[c]4,822								
04264331	St. Lawrence River at	1983	282,000	166	167	127,000	118,000	131,000	21.0	19.0	23.0
	Cornwall, Ontario, near	1976–82	287,100	165	169	129,000	109,000	158,000	20.0	16.0	22.0
	Massena, N.Y.	(Extreme yr)		(1980–81)	(1981)		(1977)	(1976)			
	median streamflow at		[c]272,800								
	Ogdensburg, N.Y.										
	SOUTHEAST										
0728900	Mississippi River at	1983	*50,300	......	......	......	......	......	....	....	....
	Vicksburg, Miss.	1976–82	502,600	200	303	321,000	163,000	633,000	29.0	23.5	34.5
		(Extreme yr)		(1981)	(1978)		(1977)	(1980)			
			[c]421,700								
	WESTERN GREAT LAKES REGION										
03612500	Ohio River at lock and dam	1983	155,000	156	195	......	38,700	101,000	....	25.5	28.5
	53, near Grand Chain, Ill.	1955–82	158,600	124	276	......	25,000	237,000	....	16.5	31.0
	(25 miles west of Paducah,	(Extreme yr)		(1965–67)	(1968)		(1966)	(1958)			
	Ky.; streamflow station		[c]143,700								
	at Metropolis, Ill.)										
	MIDCONTINENT										
06934500	Missouri River at Hermann,	1983	109,700	330	477	118,000	93,400	146,000	28.5	26.0	30.0
	Mo. (60 miles west of St.	1976–82	96,400	201	494	84,100	44,700	190,000	28.0	22.0	32.0
	Louis, Mo.)	(Extreme yr)		(1981)	(1980)		(1977)	(1981)			
			[c]75,690								
	WEST										
14128910	Columbia River at	1983	203,000	78	88	44,600	32,200	53,700	19.0	17.5	20.0
	Warrendale, Oreg.	1976–82	187,400	66	93	38,200	12,500	65,100	18.0	16.0	21.0
	(streamflow station	(Extreme yr)		(1976–82)	(1977)		(1977)	(1981)			
	at The Dalles, Oreg.)		[c]279,500								

[a]Dissolved-solids concentrations when not analyzed directly, are calculated on basis of measurements of specific conductance.
[b]To convert °C to °F: $[(1.8 \times °C) + 32] = °F$.
[c]Median of monthly values for 30-year reference period, water years 1951–80, for comparison with data for current month.
*Dissolved-solids and water-temperature records are not available for July.

WETLAND HYDROLOGY AND TREE DISTRIBUTION OF THE APALACHICOLA RIVER FLOOD PLAIN, FLORIDA

The abstract and illustrations below are from the report, *Wetland hydrology and tree distribution of the Apalachicola River flood plain, Florida*, by Helen M. Leitman, James E. Sohm, and Marvin A. Franklin, U.S. Geological Survey Water Supply Paper 2196A, 52 pages, 1983. This report may be purchased for $6.00 from Eastern Distribution Branch, Text Products Section, U.S. Geological Survey, 604 S. Pickett St., Alexandria, VA 22304 (check or money order payable to U.S. Geological Survey); or from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402 (payable to Superintendent of Documents).

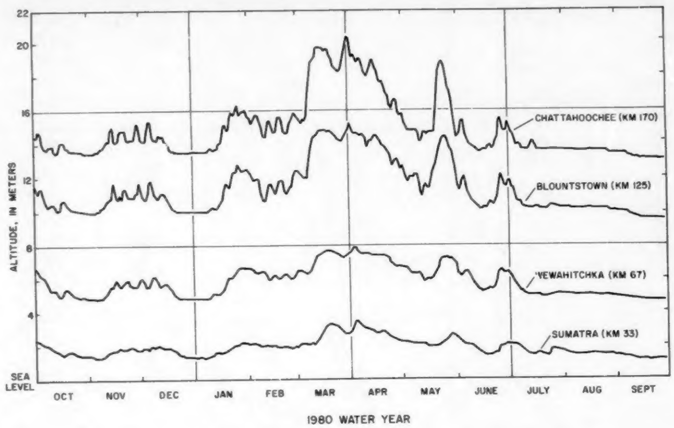


Figure 1. River stage at four gaging stations on the Apalachicola River for water year 1980.

ABSTRACT

The Apalachicola River in northwest Florida is part of a three-State drainage basin encompassing 50,800 km^2 in Alabama, Georgia, and Florida. The river is formed by the confluence of the Chattahoochee and Flint Rivers at Jim Woodruff Dam from which it flows 171 km to Apalachicola Bay in the Gulf of Mexico. Its average annual discharge at Chattahoochee, Fla., is 690 m^3/s (1958–80) with annual high flows averaging nearly 3,000 m^3/s. Its flood plain supports 450 km^2 of bottom-land hardwood and tupelo-cypress forests.

The Apalachicola River Quality Assessment focuses on the hydrology and productivity of the flood-plain forest. The purpose of this part of the assessment is to address river and flood-plain hydrology, flood-plain tree species and forest types, and water and tree relations. Seasonal stage fluctuations in the upper river are three times greater than in the lower river. (See figure 1.) Analysis of long-term streamflow record revealed that 1958–79 average annual and monthly flows and flow durations were significantly greater than those of 1929–57, probably because of climatic changes. However, stage durations for the later period were equal to or less than those of the earlier period. (See figure 2.) Height of natural riverbank levees and the size and distribution of breaks in the levees have a major controlling effect on flood-plain hydrology. Thirty-two kilometers upstream of the bay, a flood-plain stream called the Brothers River was commonly under tidal influence during times of low flow in the 1980 water year. At the same distance upstream of the bay, the Apalachicola River was not under tidal influence during the 1980 water year.

Of the 47 species of trees sampled, the five most common were wet-site species constituting 62 percent of the total basal area. In order of abundance, they were water tupelo, Ogeechee tupelo, baldcypress, Carolina ash, and swamp tupelo. Other common species were sweetgum, overcup oak, planertree, green ash, water hickory, sugarberry, and diamond-leaf oak. Five forest types were defined on the basis of species predominance by basal area. Biomass increased downstream and was greatest in forests growing on permanently saturated soils.

Depth of water, duration of inundation and saturation, and water-level fluctuation, but not water velocity, were highly correlated with forest types. Most forest types dominated by tupelo and baldcypress grew on permanently saturated soils that were inundated by flood waters 50 to 90 percent of the time, or an average of 75 to 225 consecutive days during the growing season from 1958 to 1980. Most forest types dominated by other species grew in areas that were saturated or inundated 5 to 25 percent of the time, or an average of 5 to 40 consecutive days during the growing season from 1958 to 1980. Water and tree relations varied with river location because range in water-level fluctuation and topographic relief in the flood plain diminished downstream.

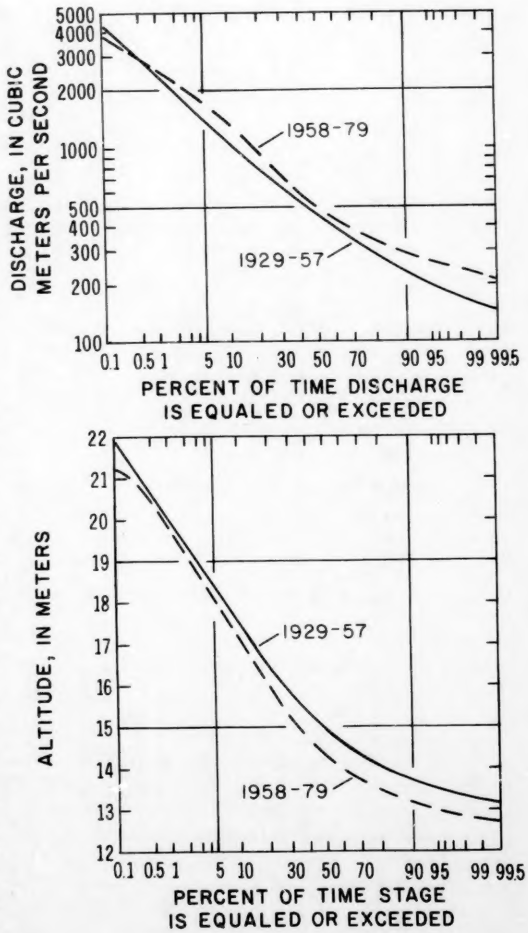


Figure 2. Flow and stage duration at Chattahoochee, 1929–57 and 1958–79.

NATIONAL WATER CONDITIONS

July 1983

Based on reports from the Canadian and U.S. Field offices; completed August 9, 1983

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EXPLANATION OF DATA

Cover map shows generalized pattern of streamflow for the month based on 18 index stream-gaging stations in Canada and 164 index stations in the United States. Alaska and Hawaii inset maps show streamflow only at the index gaging stations that are located near the points shown by the arrows.

Streamflow for the current month is compared with flow for the same month in the 30-year reference period, 1951–80. Streamflow is considered to be *below the normal range* if it is within the range of the low flows that have occurred 25 percent of the time (below the lower quartile) during the reference period. Flow is considered to be *above the normal range* if it is within the range of the high flows that have occurred 25 percent of the time (above the upper quartile).

Flow higher than the lower quartile but lower than the upper quartile is described as being *within the normal range*. In the National Water Conditions, the median is obtained by ranking the 30 flows for each month of the reference period in their order of magnitude; the highest flow is number 1, the lowest flow is number 30, and the average of the 15th and 16th highest flows is the median. One-half of the time you would expect the flows for the month to be below the median and one-half of the time to be above the median.

Statements about *ground-water levels* refer to conditions near the end of the month. The water level in each key observation well is compared with average level for the end of the month determined from the entire past record for that well or from a 30-year reference period, 1951–80. *Changes in ground-water levels*, unless described otherwise, are from the end of the previous month to the end of the current month.

Dissolved solids and temperature data for July are given for six stream-sampling sites that are part of the National Stream Quality Accounting Network (NASQAN). Dissolved solids are minerals dissolved in water and usually consist predominantly of silica and ions of calcium, magnesium, sodium, potassium, carbonate, bicarbonate, sulfate, chloride, and nitrate. Dissolved-solids discharge represents the total daily amount of dissolved minerals carried by the stream. Dissolved-solids *concentrations* are generally higher during periods of low streamflow, but the highest dissolved-solids *discharges* occur during periods of high streamflow because the total quantities of water, and therefore total load of dissolved minerals, are so much greater than at time of low flow.

METRIC EQUIVALENTS OF UNITS USED IN THE NATIONAL WATER CONDITIONS

1 foot = 0.3048 meter

1 acre-foot = 1,233 cubic meters

1 million cubic feet = 28,320 cubic meters

1 cubic foot per second =
0.02832 cubic meters per second =
1.699 cubic meters per minute

1 cubic foot per second · day = 2,447 cubic meters

1 mile = 1.609 kilometers

1 square mile = 259 hectares = 2.59 square kilometers

1 million gallons = 3,785 cubic meters =
3.785 million liters

1 million gallons per day = 694.4 gallons per minute =
2.629 cubic meters per minute =
3,785 cubic meters per day

(Round-number conversions, to nearest four significant figures)

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